

Annual Report 2010



Production Sector

Company Information

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Annual Report Summary

- ☒ BMP 1: Identify and replace high-bleed pneumatic devices **(2009)**
☐ BMP 2: Install flash tank separators on glycol dehydrators
☒ Partner Reported Opportunities *(please specify)*:

Replace compressor rod packing

Re-route blowdowns to compressor suction

Period covered by report: From: Jan. 1, 2010 To: Dec. 31, 2010

Partner Signature Required:

I hereby certify the accuracy of the data contained in this report.

Martin Wouch

8/10/2011

Date

- Because the implementation of some technologies reduces emissions for multiple years, Natural Gas STAR allows certain activities to count towards a company's emission reductions beyond the initial year of implementation. Natural Gas STAR designates the maximum length of time that these reductions may accrue as "sunset dates." The Appendix lists these sunset dates. Companies can report the corresponding methane emission reductions each year up to the allowable sunset date. Or, companies may wish to report reductions only once for the implementation year, and have EPA automatically apply the sunset date and count those emissions for the allowable number of years.
- In addition to reporting methane emissions reductions, you are welcome to include other information about your company's participation in Natural Gas STAR in the "Additional Program Accomplishments" section of this form. The Natural Gas STAR Program will use any information entered in this section to recognize the efforts and accomplishments of outstanding partners.



Production Sector Annual Report

OMB Control No. 2060-0328
Expires 07/31/2011

BMP 1: Identify and Replace High-Bleed Pneumatic Devices

Current Year Activities

A. Facility/location identifier information: *Fairway Field Facilities (2009 BMP that was not previously reported) – See PRO-5 for associated methane emissions reductions from combustion as part of same project.*

B. Facility summary:

Number of devices replaced: _____ devices

Percent of system now equipped
with low/no-bleed units: _____ %

C. Cost summary:

Estimated cost per replacement
(including equipment and labor): _____ /replacement
See Previous Years' Activities below.

D. Methane emissions reduction: _____ Mcf

See Previous Years' Activities below

E. Are these emissions reductions a one-year reduction or a multi-year reduction? ☐ One-year ☐ Multi-year

If Multi-year: For 9 devices in Previous Years' Activities below

☒ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration (BMP 1 has a sunset period of 7 years).

☐ Partner will report this activity annually up to allowed sunset date.

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

☐ Standard calculation

Methane emissions reduction = [Annual emissions from high-bleed devices being replaced (in Mcf/yr) - Annual emissions for the replacement devices (in Mcf/yr)] x Number of devices replaced

Please specify your data source:

- ☐ Field measurement
- ☐ Manufacturer specifications

☐ Calculation using default

Methane emissions reduction = 124 Mcf/yr x Number of devices replaced

☒ Other (please specify): **For 9 continuous bleed devices described in Previous Years' Activities below**

3 continuous bleed devices per heater treater (HT) – 2 HT's replaced with no-bleed units and 1 HT removed with no replacement.
From: "Process Control Goes Green" in *Valve Magazine*, Winter 2008
Figure 5 - 0.71 scfm gas bleed from 35 psig traditional controller
0.71 scfm X 3 devices/unit X 60 X 8760 = 1119.5 mscf/year per unit X 3 units = 3359 mscf/year total x 0.926 mol fraction CH₄ = 3110 Mcf/yr CH₄

F. Total value of gas saved: See Previous Years' Activities below

Total value of gas saved = Methane emissions reduction (in Mcf) x Gas value (in \$/Mcf) [if not known, use default of \$7.00/Mcf]

G. How many high-bleed devices do you plan to replace next year? TBD devices

Previous Years' Activities

Use the table below to report any past activities implemented, but not previously reported to the Natural Gas STAR Program

Year	# Devices Replaced	Total Cost of Replacements (incl. equipment and labor) (\$)	Estimated Reductions (Mcf/yr)	Value of Gas Saved (\$)
2009	9	120,000	3110	23510/year*

* Default value of \$7.00/Mcf for natural gas (methane plus other constituents)

BMP 1 Comments: *Please use the back of the page for additional space if needed. See attachment for calculations*



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BMP 2: Install Flash Tank Separators on Glycol Dehydrators

Current Year Activities

A. Facility/location identifier information:

B. Facility summary:

Number of flash tank separators installed: _____ separators

Percent of dehydrators in system equipped with flash tank separators: _____ %

C. Cost summary:

Estimated cost per flash tank separator installation (including equipment and labor): \$ _____ /installation

D. Methane emissions reduction: _____ Mcf

E. Are these emissions reductions a one-year reduction or a multi-year reduction? ☐ One-year ☐ Multi-year

If Multi-year:

☐ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration (BMP 2 has a sunset period of 10 years).

☐ Partner will report this activity annually up to allowed sunset date.

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

☐ Standard calculation

Methane emissions reduction per flash tank installation = [TEG circulation rate (in gal/hr) x Methane entrainment rate (in scf/gal)] x hours of operation (in hrs/yr) x 0.90 / 1,000

**If methane entrainment rate is not known, use a default value of 3 scf/gal for energy exchange pumps or 1 scf/gal for electric pumps*

Please specify your data source:

- ☐ Field measurement
☐ Manufacturer specifications

☐ Calculation using default

Methane emissions reduction = [Average gas throughput (in MMcf/yr) x 170 scf/MMcf x 0.90] / 1,000

☐ Other (please specify):

F. Total value of gas saved: \$ _____

Total value of gas saved = Methane emissions reduction (in Mcf) x Gas value (in \$/Mcf) [If not known, use default of \$7.00/Mcf]

G. How many flash tank separators do you plan to install next year? _____ flash tank separators

Previous Years' Activities

Use the table below to report any past activities implemented, but not previously reported to the Natural Gas STAR Program

Year	# Flash Tank Separators Installed	Total Cost of Installation (incl. equipment and labor) (\$)	Estimated Reductions (Mcf/yr)	Value of Gas Saved (\$)

BMP 2 Comments: Please use the back of the page for additional space if needed.



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Partner Reported Opportunities (PROs)

For more details on PROs, visit epa.gov/gasstar/tools/recommended.html

Current Year Activities

A. Facility/location identifier information: *PRO-5 (2009 project not reported in 2009 report) – See BMP-1 for associated high-bleed pneumatic devices methane loss reduction from same project.*

B. Activity description: Please provide a separate PRO reporting form for each activity reported. If reporting a DI&M activity, please use a separate page for each location/facility surveyed.

Please specify the technology or practice that was implemented (choose from the list in the appendix or describe your own):

Eliminate unnecessary equipment and or systems - 2009 project that was not reported previously

Please describe how your company implemented this activity:

Replaced two heater treaters rated at 9,000,000 BTU/hr each with two rated at 750,000 BTU/hr each and removed one heater treater rated at 5,000,000 for a net reduction of 21,500,000 BTU/hr burner capacity.

C. Level of Implementation (check one):

- ☐ Number of units installed: _____ units
☐ Frequency of practice: _____ times/year

See Previous Years' Activities below

D. Are emissions reductions a one-year reduction or a multi-year reduction? ☐ One-year ☒ Multi-year

If Multi-year:

☒ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration*.

☐ Partner will report this activity annually up to allowed sunset date.

E. Methane emissions reduction: _____ Mcf
See Previous Years' Activities below

F. Cost summary: Estimated cost of implementing this practice/activity (including equipment and labor): \$ _____

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

- ☐ Actual field measurement
☐ Calculation using manufacturer specifications/other source
See Attachment for calculations.

☒ Other (please specify):

G. Total value of gas saved: \$ See Previous Years' Activities below

Total value of gas saved = Methane emissions reduction (in Mcf) x Gas value (in \$/Mcf) [If not known, use default of \$7.00/Mcf]

H. To what extent do you expect to implement this practice next year?
TBD

Previous Years' Activities

Use the table below to report any past implementation of this PRO, but not previously reported to Natural Gas STAR

Year	Frequency of Practice/Activity or # of Installations	Total Cost of Practice/Activity (incl. equipment and labor) (\$)	Estimated Reductions (Mcf/yr)	Value of Gas Saved (\$)
2009	3 installations	120,000	7.7	988,785

PRO Comments: See Attachment for calculations and descriptions. Value of gas saved is calculated on \$7/Mcf, 21.5 MMBTU/hr units burning 1000 BTU/scf gas for 6570 hours (75% utilization over year, or 75% of 8760 hours/year).

**Because the implementation of some technologies reduces emissions for multiple years, Natural Gas STAR allows certain activities to count towards a company's emission reductions beyond the initial year of implementation. Natural Gas STAR designates the maximum length of time that these reductions may accrue as "sunset dates." The Appendix lists these sunset dates. Companies can report the corresponding methane emission reductions each year up to the allowable sunset date. Or, companies may wish to report reductions only once for the implementation year, and have EPA automatically apply the sunset date and count those emissions for the allowable number of years.*



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Partner Reported Opportunities (PROs)

For more details on PROs, visit epa.gov/gasstar/tools/recommended.html

Current Year Activities

A. Facility/location identifier information: *PRO-6.2010 Fairway Field Facilities (continuation from 2009)*

B. Activity description: Please provide a separate PRO reporting form for each activity reported. If reporting a DI&M activity, please use a separate page for each location/facility surveyed.

Please specify the technology or practice that was implemented (choose from the list in the appendix or describe your own):

Directed inspection and maintenance (DI&M) of storage tank hatches resulting in replacement of tank hatches.

Please describe how your company implemented this activity:

Began by replacing hatch gaskets as part of DI&M program. Later began replacing thief hatches when gasket life was shorter than expected.

C. Level of Implementation (check one):

- ☐ Number of units installed: 35 units
☐ Frequency of practice: NA times/year

D. Are emissions reductions a one-year reduction or a multi-year reduction? ☐ One-year ☒ Multi-year

If Multi-year:

☒ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration*.

☐ Partner will report this activity annually up to allowed sunset date.

E. Methane emissions reduction: 1879 Mcf

F. Cost summary: Estimated cost of implementing this practice/activity (including equipment and labor): \$10500

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

☐ Actual field measurement

☒ Other (please specify):

☐ Calculation using manufacturer specifications/other source

ER = EF(AF)(XCH4)(70%) from EPA Natural Gas STAR spreadsheet, "Natural Gas STAR Recommended Technologies and Practices - Quantification Methods". **See Attachment**

G. Total value of gas saved: \$ 2029

Total value of gas saved = Methane emissions reduction (in Mcf)

x Gas value (in \$/Mcf) [If not known, use default of \$7.00/Mcf]

Default value of \$7.00/Mcf for natural gas (methane plus other constituents)

H. To what extent do you expect to implement this practice next year?

Project completed for this area, unless additional facilities are added.

Previous Years' Activities

Use the table below to report any past implementation of this PRO, but not previously reported to Natural Gas STAR

Year	Frequency of Practice/Activity or # of Installations	Total Cost of Practice/Activity (incl. equipment and labor) (\$)	Estimated Reductions (Mcf/yr)	Value of Gas Saved (\$)

PRO Comments: Please use the back of the page for additional space if needed.

*Because the implementation of some technologies reduces emissions for multiple years, Natural Gas STAR allows certain activities to count towards a company's emission reductions beyond the initial year of implementation. Natural Gas STAR designates the maximum length of time that these reductions may accrue as "sunset dates." The Appendix lists these sunset dates. Companies can report the corresponding methane emission reductions each year up to the allowable sunset date. Or, companies may wish to report reductions only once for the implementation year, and have EPA automatically apply the sunset date and count those emissions for the allowable number of years.



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Partner Reported Opportunities (PROs)

For more details on PROs, visit epa.gov/gasstar/tools/recommended.html

Current Year Activities

A. Facility/location identifier information: *PRO-7 Fairway Field Facilities*

B. Activity description: Please provide a separate PRO reporting form for each activity reported. If reporting a DI&M activity, please use a separate page for each location/facility surveyed.

Please specify the technology or practice that was implemented (choose from the list in the appendix or describe your own):

Replaced rod packing in 3 compressors

Please describe how your company implemented this activity:

Performed as part of maintenance program

C. Level of Implementation (check one):

- ☐ Number of units installed: 3 units
☐ Frequency of practice: Varies times/year

D. Are emissions reductions a one-year reduction or a multi-year reduction? ☐ One-year ☒ Multi-year

If Multi-year:

☒ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration*.

☐ Partner will report this activity annually up to allowed sunset date.

E. Methane emissions reduction: 2403 Mcf

F. Cost summary: Estimated cost of implementing this practice/activity (including equipment and labor): \$ 1620
Note: Performed as part of maintenance contract with no additional cost to operator.

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

- ☐ Actual field measurement ☒ Other (please specify): **See attachment for details**
☐ Calculation using manufacturer specifications/other source
865 Mcf/year/packing replacement (with 0.926 mol fraction CH₄), from EPA Natural Gas STAR spreadsheet, "Natural Gas STAR Recommended Technologies and Practices - Quantification Methods", referencing Reducing Methane Emissions from Compressors and Rod Packing Systems Lessons Learned http://www.epa.gov/gasstar/documents/ll_rodpack.pdf

G. Total value of gas saved: \$ 18165

Total value of gas saved = Methane emissions reduction (in Mcf)
x Gas value (in \$/Mcf) [If not known, use default of \$7.00/Mcf]
Default value of \$7.00/Mcf for natural gas (methane plus other constituents)

H. To what extent do you expect to implement this practice next year?

To be determined based on maintenance schedule.

Previous Years' Activities

Use the table below to report any past implementation of this PRO, but not previously reported to Natural Gas STAR

Year	Frequency of Practice/Activity or # of Installations	Total Cost of Practice/Activity (incl. equipment and labor) (\$)	Estimated Reductions (Mcf/yr)	Value of Gas Saved (\$)

PRO Comments: Please use the back of the page for additional space if needed.

*Because the implementation of some technologies reduces emissions for multiple years, Natural Gas STAR allows certain activities to count towards a company's emission reductions beyond the initial year of implementation. Natural Gas STAR designates the maximum length of time that these reductions may accrue as "sunset dates." The Appendix lists these sunset dates. Companies can report the corresponding methane emission reductions each year up to the allowable sunset date. Or, companies may wish to report reductions only once for the implementation year, and have EPA automatically apply the sunset date and count those emissions for the allowable number of years.



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Partner Reported Opportunities (PROs)

For more details on PROs, visit epa.gov/gasstar/tools/recommended.html

Current Year Activities

A. Facility/location identifier information: *PRO-8 Fairway Field Facilities*

B. Activity description: Please provide a separate PRO reporting form for each activity reported. If reporting a DI&M activity, please use a separate page for each location/facility surveyed.

Please specify the technology or practice that was implemented (choose from the list in the appendix or describe your own):

Redesign of blowdown systems (compressors)

Please describe how your company implemented this activity:

Re-routed blowdowns from discharge to atmosphere into suction line of compressors

C. Level of Implementation (check one):

- ☐ Number of units installed: 11 units
☐ Frequency of practice: 480 times/year

D. Are emissions reductions a one-year reduction or a multi-year reduction? ☐ One-year ☒ Multi-year

If Multi-year:

☒ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration*.

☐ Partner will report this activity annually up to allowed sunset date.

E. Methane emissions reduction: 845 Mcf

F. Cost summary: Estimated cost of implementing this practice/activity (including equipment and labor): \$ 13200

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

- ☐ Actual field measurement
☒ Calculation using manufacturer specifications/other source

☐ Other (please specify):

Based on gas volume released per blowdown, as calculated by maintenance contractor, and 480 blowdowns per year. **See Attachment.**

G. Total value of gas saved: \$ 6384

Total value of gas saved = Methane emissions reduction (in Mcf)
x Gas value (in \$/Mcf) [If not known, use default of \$7.00/Mcf]
Default value of \$7.00/Mcf for natural gas (methane plus other constituents)

H. To what extent do you expect to implement this practice next year?

Plan to implement this practice in N. Louisiana field.

Previous Years' Activities

Use the table below to report any past implementation of this PRO, but not previously reported to Natural Gas STAR

Year	Frequency of Practice/Activity or # of Installations	Total Cost of Practice/Activity (incl. equipment and labor) (\$)	Estimated Reductions (Mcf/yr)	Value of Gas Saved (\$)

PRO Comments: Please use the back of the page for additional space if needed.

*Because the implementation of some technologies reduces emissions for multiple years, Natural Gas STAR allows certain activities to count towards a company's emission reductions beyond the initial year of implementation. Natural Gas STAR designates the maximum length of time that these reductions may accrue as "sunset dates." The Appendix lists these sunset dates. Companies can report the corresponding methane emission reductions each year up to the allowable sunset date. Or, companies may wish to report reductions only once for the implementation year, and have EPA automatically apply the sunset date and count those emissions for the allowable number of years.



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Additional Program Accomplishments

The Natural Gas STAR Program will use any information entered here to recognize the efforts and achievements of outstanding partners.

Please include any additional information you would like to share about your company's participation in Natural Gas STAR. Examples may include:

- Activities to strengthen your program (e.g., training/education, innovative technologies or activities, pilot projects, employee incentive programs).
 - Efforts to communicate your participation and successes (e.g., internal newsletters, press releases, company website).
 - Participation in Natural Gas STAR program activities (e.g., contributions to case studies, presentation at annual workshop).
-

Additional Accomplishments:

Additional Accomplishments Comments: *Please use the back of the page for additional space if needed.*

ATTACHMENT

EMISSION CALCULATION METHODS

PRO-1 through PRO-4 reported for Reporting Year 2008, with PRO-3.2009 reported in 2009 as a continuation of PRO-3.

PRO-5, reported in 2009, is being amended to include the downsizing or replacement of 3 heater treaters. It is related to BMP-1 in that the removal/replacement of the same heater treaters resulted in a reduction of continuous-bleed devices.

PRO-6.2010 is a continuation of PRO-6, which began in 2009.

PRO-7 and PRO-8 are new for reporting year 2010.

BMP-1 was a 2009 project that was not reported and is being recorded with the 2010 report. It is related to PRO-5 in that the removal/replacement of the same heater treaters resulted in reduction of methane emissions due to combustion sources.

BMP-1 Pneumatic Devices

2009 (not reported in 2009) – Replaced or removed 3 heater treaters with 3 continuous bleed controllers per heater treater. 2 heater treaters were replaced with smaller units with no-bleed controllers, and 1 heater treater was removed without replacement.

Calculate emissions reductions using the following equation:

$$ER = (AF)(EF)(XCH_4) - 373.18 \times 9 \times 0.926 = 3110 \text{ Mcf/year}$$

Where,

ER = Emissions Reductions (Mcf/year)

AF = Activity Factor (number of devices, or number of plants in processing sector case) = 9

EF = Emissions Factor (Mcf/year/device) = 373.18

Based on 0.71 scfm bleed from 35 psia (supply gas pressure) traditional controller:

$$0.71 \text{ scfm} \times 60 \times 8760 = 373.18 \text{ Mscf/year/device}$$

XCH₄ = Mole fraction of methane in the gas (decimal) = 0.926 from field measurement

References:

"Process Control Goes Green" in Valve Magazine, Winter 2008

http://www.documentation.emersonprocess.com/groups/public/documents/articles_articlesreprints/process_controls_go_green.pdf for full article or

<http://www.valvemagazine.com/index.php/magazine/past-articles/feature-articles/78-winter-2008-process-control-goes-green> for article without figures

PRO-5: Eliminate Unnecessary Equipment or Systems

2009 project that was not reported previously: Replaced two heater treaters rated at 9,000,000 BTU/hr each with two rated at 750,000 BTU/hr each and removed one heater treater rated at 5,000,000 for a net reduction of 21,500,000 BTU/hr burner capacity.

Emission reductions were calculated using the following equation:

$$ER = EF \times BR \times HV \times \text{Hours/year}$$

$$ER_p = 2.3 \text{ lb/MMscf} \times 21.5 \text{ MMBTU/hr} \times 1 \text{ scf/1000 BTU} \times 6570 \text{ hours/year} = 324.9 \text{ lb/year CH}_4$$

$$ER = 324.9 \text{ lb/year} \times 1 \text{ lb-mole/16 lbs} \times 379.5 \text{ scf/lb-mole} = 7.706 \text{ Mscf/year}$$

Where,

ER_p = Methane emission reduction (lbs/year)

ER = Methane emission reductions (Mcf/year)

EF = Emissions Factor = 2.3 lb/MMscf of natural gas combusted

BR = Burner rating reduction = 21.5 MMBTU/hr from replacement with smaller units and one removal with no replacement

HV = Fuel heating value (assume 1000 BTU/scf)

References: API Compendium (2004), which references AP-42, Table 1.4-2.

Assumptions:

Heater treaters are fired 75% of the time = 6570 hours/year

Molecular weight of methane (CH₄) = 16
1 mole of an Ideal Gas occupies 379.5 scf

PRO-6.2010 Directed Inspection & Maintenance at Fairway Field Facilities Tank Batteries

2010: Continuation of program from 2009. 35 remaining tank hatches were replaced (10 were replaced in 2009). Replacement gaskets found to deteriorate quickly, resulting in leakage, so continued replacing hatches into 2010.

ER = EF(AF)(XCH₄)(70%) reduction on average through DI&M
ER = (82.80)(35)(0.926)(0.70) = 1878.5

Where,

ER = Emissions Reductions (Mcf/year)

EF = Emissions Reductions Factors (Mcf/year) = 82.80 MCF/yr natural gas per component*

AF = Activity Factor (number of components) = 35

XCH₄ = Mole fraction of methane in the gas (decimal) = 0.926 from measurement

* Obtained from epa.gov/gasstar/documents/xls/quantifying_ngs_methane_reductions.xls in Worksheet "Other", DI&M at Remote Sites for Gas Plant/Non-compressor related

PRO-7 Compressor Rod Packing Replacement

Replaced rod packing on 3 compressors

Pipeline Research Committee International reports typical emissions reductions of 865 Mcf/year/packing replacement.

Calculate the emissions reductions using the following equation:

ER = AF(865 Mcf/year/packing replacement) (XCH₄)

ER = 3(865)(0.926) = 2403 Mcf

Where,

ER = Emissions Reductions (Mcf/year)

AF = Activity Factor (number of rod packing replacements/year) = 3

XCH₄ = Mole fraction of methane in the gas (decimal) = 0.926 from field measurement

References:

Equation to estimate emissions – From EPA Natural Gas STAR spreadsheet, "Natural Gas STAR Recommended Technologies and Practices - Quantification Methods", referencing Reducing Methane Emissions from Compressors and Rod Packing Systems Lessons Learned

http://www.epa.gov/gasstar/documents/ll_rodpack.pdf

PRO-8 Redesign Blowdown Systems (Compressors)

Re-route blowdown exhaust to suction line for 11 compressors.

1.9 Mscf/blowdown = calculated blowdown volume from compressor maintenance contractor:
Approximately 40 blowdowns/month now routed to the compressor suction line rather than vented.

ER = AF(1.9 Mscf/blowdown)(XCH₄)

ER = 480(1.9)(0.926) = 844.5 Mcf/year

Where,

ER = Emissions Reductions (Mcf/year)

AF = Activity Factor (number of blowdowns/year) = 480

XCH₄ = Mole fraction of methane in the gas (decimal) = 0.926 from field measurement